No. 200900390

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

An application requesting a certificate of protection for an alleged distinct variety of sexually reproduced, or tuber propagated plant, the name and description of which are contained in the application and exhibits, a copy of which is hereunto annexed and made a part hereof, and the various requirements of LAW in such cases made and provided have been complied with, and the title thereto is, from the records of the PLANT VARIETY PROTECTION OFFICE, in the applicant(s) indicated in the said copy, and Whereas, upon due examination made, the said applicant(s) is (are) adjudged to be entitled to a certificate of plant variety protection under the LAW.

Now, therefore, this certificate of plant variety protection is to grant unto the said applicant(s) and the successors, heirs or assigns of the said applicant(s) for the term of TWENTY years from the date of this grant, subject to the payment of the required fees and periodic replenishment of viable basic seed of the variety in a public repository as provided by LAW, the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety therefrom, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'PHVP4'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the* ***City of Washington, D.C.*** *this thirtieth day of April, in the year* ***two thousand and thirteen.***

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions*

Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER
Pioneer Hi-Bred International, Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME

3. VARIETY NAME
PHVP4

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
7100 NW 62nd Avenue
P.O. Box 1014
Johnston, Iowa 50131-1014 USA

5. TELEPHONE *(include area code)*
(515) 535-6975

6. FAX *(include area code)*
(515) 535-2125

FOR OFFICIAL USE ONLY

PVPO NUMBER
200900390

FILING DATE
07/15/2009

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
Corporation

8. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

9. DATE OF INCORPORATION
March 5, 1999

FEES RECEIVED
FILING AND EXAMINATION FEES: $ 4382.00
DATE 07/15/2009
CERTIFICATION FEE: $
DATE

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*
Bradford D. Hall
Pioneer Hi-Bred International, Inc.
Crop Genetics Research and Development
PO Box 85
Johnston, Iowa 50131-0085 USA

11. TELEPHONE (Include area code)
(515) 535-6975

12. FAX (Include area code)
(515) 535-2125

13. E-MAIL
brad.hall@pioneer.com

14. CROP KIND *(Common Name)*
Corn

15. GENUS AND SPECIES NAME OF CROP
Zea mays

16. FAMILY NAME *(Botanical)*
Gramineae

17. IS THE VARIETY A FIRST GENERATION HYBRID?
☐ YES ☒ NO

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (*OPTIONAL*)
☐ YES ☐ NO
IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION. _____

19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)
- a. ☒ Exhibit A. Origin and Breeding History of the Variety
- b. ☒ Exhibit B. Statement of Distinctness
- c. ☒ Exhibit C. Objective Description of Variety
- d. ☐ Exhibit D. Additional Description of the Variety *(Optional)*
- e. ☒ Exhibit E. Statement of the Basis of the Owner's Ownership
- f. ☒ Exhibit F. Declaration Regarding Deposit
- g. ☒ Voucher Sample *(3,000 viable untreated seeds or, for tuber propagated varieties, verification* that tissue culture will be deposited and maintained in an approved public repository)
- h. ☒ Filing and Examination Fee ($4,382), made payable to "*Treasurer of the United States*" *(Mail to the Plant Variety Protection Office)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*
☐ YES *(if "yes", answer items 21 and 22 below)*
☒ NO *(if "no", go to item 23)*
☐ UNDECIDED

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?
☐ YES ☐ NO
IF YES, WHICH CLASSES? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO
IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED
(If additional explanation is necessary, please use the space indicated on the reverse.)

23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?
☒ YES ☐ NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
☒ YES ☐ NO
IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is (are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
NAME *(Please print or type)*		NAME *(Please print or type)*	**Bradford D. Hall**
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
		Sr. Research Associate	11/14/2012

Original application was signed on 6-29-2009

ST-470 (07-01-2009) designed by the Plant Variety Protection Office

2012 NOV 16 PM 5:40

GENERAL INSTRUCTIONS: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E, F; (3) for a tuber reproduced variety, verification that a viable *(in the sense that it will reproduce an entire plant)* tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for $4,382 ($518 filing fee and $3,864 examination fee), payable to "Treasurer of the United States" *(See Section 97.6 of the Regulations and Rules of Practice).* **NEW:** With the application for a seed reproduced variety **or by direct deposit soon after filing**, the applicant must provide at least 3,000 viable untreated seeds of the variety *per se*, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to reproduce the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of $768 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. *(See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)*

Plant Variety Protection Office
Telephone: (301) 504-5518 **FAX:** (301) 504-5291
General E-mail: PVPOmail@usda.gov
Homepage: http://www.ams.usda.gov/science/pvpo/PVPindex.htm

SPECIFIC INSTRUCTIONS:
To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and **provide** evidence that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, **Seed Regulatory and Testing Branch**, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870. http://www.ams.usda.gov/lsg/seed.htm.

ITEM

19a. Give:
(1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified

19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:

(1) identify these varieties and state all differences objectively;
(2) attach replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.

19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.

19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, *etc.*

19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.

20. If "Yes" is specified *(seed of this variety be sold by variety name only, as a class of certified seed)*, the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. *(See Regulations and Rules of Practice, Section 97.103).*

23. *See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.*

24. *See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.*

22. CONTINUED FROM FRONT *(Please provide a statement as to the limitation and sequence of generations that may be certified.)*

23. CONTINUED FROM FRONT *(Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)*

Transferred for experimental use in United States in 2009.

24. CONTINUED FROM FRONT *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)*

USPTO 6/9/2009 Application No. 12/480,705 Patent No. 7,994,405.

Exhibit A: Origin and Breeding History for PHVP4

#200900390

Pioneer line PHVP4, Zea mays L., a yellow corn inbred, was developed by Pioneer Hi-Bred International, Inc. from the single cross hybrid PHC8H X PHCND (PVP Certificate No. 200500230) using the pedigree selection method of plant breeding. Varieties PHC8H and PHCND are proprietary inbred lines of Pioneer Hi-Bred International, Inc. Variety PHC8H was derived from PH24E (PVP Certificate No. 9600204) and PH1BC (PVP Certificate No. 200000242). Selfing was practiced from above hybrid for 8 generations using pedigree selection. During line development, crosses were made to inbred testers for the purpose of estimating the line's combining ability. Yield trials were grown at York, NE, USA as well as other Pioneer research locations. After initial testing, additional hybrid combinations have been evaluated and subsequent generations of the line have been grown and hand-pollinated with observations again made for uniformity.

Variety PHVP4 has shown uniformity and stability for all traits as described in Exhibit C – "Objective Description of Variety." It has been self-pollinated and ear rowed for 6 generations with careful attention paid to selection criteria and uniformity of plant type to assure genetically homozygous and phenotypic stability. The line has been increased both by hand and in isolated fields with continued observations for uniformity and stability, and for 4 generations during the final stages of inbred development and seed multiplication. Very high standards for genetic purity have been established morphologically using field observations and using sound laboratory methodologies.

No variant traits have been observed or are expected in PHVP4.

The criteria used in the selection of PHVP4 were yield, both per se and in hybrid combinations. Late season plant health, grain quality, and stalk lodging resistance, were important criteria considered during selection. Other selection criteria include: ability to germinate in adverse conditions, disease and insect resistance, pollen yield and tassel size.

Exhibit A: Developmental History for PHVP4

Pedigree	***Year Grown***	***Inbreeding Level of Pedigree Grown***
PHC8H/PHCND	2002	F1
PHC8H/PHCND)X	2003	F2
PHC8H/PHCND)X4	2003	F3
PHC8H/PHCND)X42	2004	F4
PHC8H/PHCND)X421	2004	F5
PHC8H/PHCND)X4211	2005	F6
PHC8H/PHCND)X42113	2006	F7
PHC8H/PHCND)X421133	2007	F8
PHC8H/PHCND)X421133X		F9 (Seed)

PHVP4 was selfed and ear-rowed from F3 through F8 generation. Uniformity and stability were established from F6 through F8 generation and beyond when seed supplies were increased.

Exhibit B: Novelty Statement

Variety PHVP4 mostly resembles Pioneer Hi-Bred International, Inc. proprietary inbred line PHCND (PVP Certificate No. 200500230). Table 1 shows two sample t-tests on data collected primarily in Johnston and Dallas Center, Iowa in 2008. The traits collectively show measurable differences between the two varieties.

Variety PHVP4 has a wider cob diameter (27.2 mm vs. 24.4 mm) than variety PHCND (Table 1).

Variety PHVP4 has a shorter ear length (12.0 cm vs. 15.5 cm) than variety PHCND (Table 1).

Variety PHVP4 has a longer husk extension length (11.9 cm vs. 5.6 cm) than variety PHCND (Table 1).

Exhibit B: Novelty Statement Table

Table 1: Data from Johnston and Dallas Center, Iowa in 2008 presented by trait, across environments, and broken out by environment. Data are supporting evidence for differences between PHVP4 and PHCND. Varieties were grown in two locations that had different environmental conditions. Environments had different planting dates and were in different fields. A two-sample t-test was used to compare differences between means.

PHVP4_PHCND

Cob diameter (mm)

Level	Location	Variety-1	Variety-2	Cnt-1	Cnt-2	Mean-1	Mean-2	Mean_Diff	StDev-1	StDev-2	StErr-1	StErr-2	DF	t-Value	Prob_Pool
1. Over All		PHVP4	PHCND	30	30	27.2	24.4	2.8	1.177	0.935	0.215	0.171	58	10.0	0.000
2. Year		PHVP4	PHCND	30	30	27.2	24.4	2.8	1.177	0.935	0.215	0.171	58	10.0	0.000
3. Environ.	DSBNITDS_2008	PHVP4	PHCND	15	15	27.2	24.3	2.9	0.862	0.704	0.223	0.182	28	10.2	0.000
3. Environ.	JHBNIT08_2008	PHVP4	PHCND	15	15	27.1	24.6	2.5	1.457	1.121	0.376	0.289	28	5.3	0.000

Ear length (cm)

Level	Location	Variety-1	Variety-2	Cnt-1	Cnt-2	Mean-1	Mean-2	Mean_Diff	StDev-1	StDev-2	StErr-1	StErr-2	DF	t-Value	Prob_Pool
1. Over All		PHVP4	PHCND	30	30	12.0	15.5	-3.5	0.964	0.776	0.176	0.142	58	-15.5	0.000
2. Year		PHVP4	PHCND	30	30	12.0	15.5	-3.5	0.964	0.776	0.176	0.142	58	-15.5	0.000
3. Environ.	DSBNITDS_2008	PHVP4	PHCND	15	15	12.3	15.3	-3.0	0.900	0.799	0.232	0.206	28	-9.4	0.000
3. Environ.	JHBNIT08_2008	PHVP4	PHCND	15	15	11.7	15.8	-4.1	0.961	0.676	0.248	0.175	28	-13.4	0.000

Husk extension length (cm)

Level	Location	Variety-1	Variety-2	Cnt-1	Cnt-2	Mean-1	Mean-2	Mean_Diff	StDev-1	StDev-2	StErr-1	StErr-2	DF	t-Value	Prob_Pool
1. Over All		PHVP4	PHCND	30	30	11.9	5.6	6.3	1.172	0.556	0.214	0.102	58	26.6	0.000
2. Year		PHVP4	PHCND	30	30	11.9	5.6	6.3	1.172	0.556	0.214	0.102	58	26.6	0.000
3. Environ.	DSBNITDS_2008	PHVP4	PHCND	15	15	11.7	5.7	6.0	1.047	0.594	0.270	0.153	28	19.1	0.000
3. Environ.	JHBNIT08_2008	PHVP4	PHCND	15	15	12.2	5.5	6.7	1.265	0.516	0.327	0.133	28	18.9	0.000

EXHIBIT C
(Corn; Maize)
(8-22-2001)

United States Department of Agriculture, Agricultural Marketing Service
Science and Technology, Plant Variety Protection Office
National Agricultural Library Building, Room 400
Beltsville, MD 20705-2351

OBJECTIVE DESCRIPTION OF VARIETY
CORN (Zea mays L.)

Name of Applicant(s)	Variety Seed Source	Variety Name or Temporary Designation
Pioneer Hi-Bred International, Inc.		PHVP4

Address (Street & No., or R.F.D. No., City, State, Zip Code and Country	**FOR OFFICIAL USE**	PVPO Number
7250 NW 62nd Avenue, P.O. Box 552, Johnston, Iowa 50131-0552		**#200900390**

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a "*" are considered necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices; describe #25 and #26 in Comments section):

01. Light Green	06. Pale Yellow	11. Pink	16. Pale Purple	21. Buff	26. Other (Describe)
02. Medium Green	07. Yellow	12. Light Red	17. Purple	22. Tan	
03. Dark Green	08. Yellow-Orange	13. Cherry Red	18. Colorless	23. Brown	
04. Very Dark Green	09. Salmon	14. Red	19. White	24. Bronze	
05. Green-Yellow	10. Pink-Orange	15. Red & White	20. White Capped	25. Variegated (Describe)	

STANDARD INBRED CHOICES [Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data]:

Yellow Dent Families:		Yellow Dent (Unrelated):	Sweet Corn:
Family	Members	Co109, ND246	C13, Iowa5125, P39, 2132
B14	CM105, A632, B64, B68	Oh7, T232	
B37	B37, B76, H84	W117, W153R	Popcorn:
B73	N192, A679, B73, Nc268	W182BN	SG1533, 4722, HP301, HP7211
C103	Mo17, Va102, Va35, A682		
Oh43	A619, MS71, H99, Va26	White Dent:	Pipecorn:
WF9	W64A, A554, A654, Pa91	CI66, H105, Ky228	Mo15W, Mo16W, Mo24W

1. TYPE: (describe intermediate types in "Comments" section)	Standard Inbred Name	B73
2 (1=Sweet, 2=Dent, 3=Flint, 4=Flour, 5=Pop, 6=Ornamental, 7=Pipecorn)	2 Type	

2. REGION WHERE DEVELOPED IN THE U.S.A.:	Standard Seed Source	PI 550473
2 (1=N.West, 2=N.Central, 3=N.East, 4=S.East, 5=S.Central, 6=S.West, 7=Other	_ Region	

3. MATURITY (In Region Best Adaptability; show Heat Unit formula in "Comments" section):

DAYS	HEAT UNITS		DAYS	HEAT UNITS
54	1,150.5	From emergence to 50% of plants in silk	60	1,296.0
56	1,196.0	From emergence to 50% of plants in pollen	61	1,322.0
1	25	From 10% to 90% pollen shed	1	26
---	----._	From 50% silk to optimum edible quality	---	----._
---	----._	From 50% silk to harvest at 25% moisture	---	----._

4. PLANT:	St.Dev.	Sample Size	Mean	St.Dev.	Sample Size
187.7 cm Plant Height (to tassel tip)	10.69	15	260.4	8.63	15
73.9 cm Ear Height (to base of top ear node)	6.48	15	110.3	7.61	15
15.6 cm Length of Top Ear Internode	0.51	15	14.0	1.25	15
0.0 Average Number of Tillers		1*	0.1		1*
1.2 Average Number of Ears per Stalk		1*	0.9		1*
4 Anthocyanin of Brace Roots: 1=Absent, 2=Faint, 3=Moderate, 4=Dark			4		

#200900390

Application Variety Data				Standard Inbred Data		
5. LEAF	St.Dev.	Sample Size		Mean	St.Dev.	Sample Size
9.6 cm Width of Ear Node Leaf	0.51	15		9.1	0.64	15
70.2 cm Length of Ear Node Leaf	2.48	15		76.4	3.42	15
4.5 Number of leaves above top ear	0.52	15		6.1	0.46	15
21.3 Degrees Leaf Angle	2.29	15		18.3	3.09	15
(Measure from 2nd leaf above ear at anthesis to stalk above leaf)						
4 Leaf Color (Munsell Code) 5GY36				4 (Munsell Code) 7.5GY34		
3 Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)				3		
__ Marginal Waves (Rate on scale from 1=none to 9=many)				—		
__ Longitudinal Creases (Rate on scale from 1=none to 9=many)				—		
6. TASSEL:	St.Dev.	Sample Size		Mean	St.Dev.	Sample Size
3.7 Number of Primary Lateral Branches	0.96	15		8.2	1.52	15
15.0 Degrees Branch Angle from Central Spike	4.23	15		20.0	5.00	15
51.2 cm tassel Length	2.18	15		50.9	3.92	15
(from top leaf collar to tassel tip)						
4 Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed)				6		
11 Anther Color (Munsell Code) 10RP68				7 (Munsell Code) 5Y8.54		
2 Glume Color (Munsell Code) 2.5GY66				2 (Munsell Code) 5GY56		
1 Bar Glumes (Glume Bands): 1=Absent, 2=Present				1		
7a. EAR (Unhusked Data):						
14 Silk Color (3 days after emergence) (Munsell Code) 10RP310				1 Munsell Code 2.5GY94		
2 Fresh Husk Color (25 days after 50% silking) (Munsell Code) 5GY78				2 Munsell Code 5GY78		
21 Dry Husk Color (65 days after 50% silking) (Munsell Code) 10YR84				21 Munsell Code 2.5Y8.54		
1 Position of Ear at Dry Husk Stage: 1=Upright, 2=Horizontal, 3=Pendent				2		
8 Husk Tightness (Rate on scale from 1=very loose to 9=very tight				7		
4 Husk Extension (at harvest): 1=Short(ears exposed), 2=Medium (<8cm), 3=Long (8-10cm beyond ear tip), 4=Very Long (>10cm)				3		
7b. EAR (Husked Ear Data)	St. Dev.	Sample Size		Mean	St.Dev.	Sample Size
12.3 cm Ear Length	0.90	15		13.8	0.68	15
47.7 mm Ear Diameter at mid-point	1.72	15		45.1	1.13	15
127.1 gm Ear Weight	15.59	15		128.7	15.24	15
17.5 Number of Kernel Rows	1.19	15		17.5	1.41	15
2 Kernel Rows: 1=Indistinct, 2=Distinct				2		
2 Row Alignment: 1=Straight, 2=Slightly Curved, 3=Spiral				1		
12.8 cm Shank Length	2.83	15		7.4	1.64	15
1 Ear Taper: 1=Slight cyl., 2=Average slightly con., 3=Extreme conical				1		
8. KERNEL (Dried):	St.Dev.	Sample Size		Mean	St.Dev.	Sample Size
11.3 mm Kernel Length	0.88	15		11.1	0.46	15
9.6 mm Kernel Width	0.74	15		7.0	0.53	15
5.7 mm Kernel Thickness	0.96	15		4.1	0.26	15
82.7 % Round Kernels (Shape Grade)		1**		17.2		1**
1 Aleurone Color Pattern: 1=Homozygous, 2=Segregating (describe)		_____		1 (describe)		_____
7 Aleurone Color (Munsell Code) 10YR814				7 Munsell Code 2.5Y812		
7 Hard Endosperm Color (Munsell Code) 10YR714				7 Munsell Code 10YR712		
3 Endosperm Type: 1=Sweet(su1), 2=Extra Sweet(sh2), 3=Normal Starch, 4=High Amylose Starch, 5=Waxy Starch, 6=High Protein, 7=High Lysine, 8=Super Sweet (se), 9=High Oil, 10=Other_____				3 (describe)		_____
33.0 gm Weight per 100 kernels (unsized sample)		1**		20.6		1**
9. COB:	St.Dev.	Sample Size		Mean	St.Dev	Sample Size
27.2 mm Cob Diameter at mid-point	0.86	15		24.9	0.83	15
10 Cob Color (Munsell Code) 10R58				11 Munsell Code 10R66		

Note: Use chart on first page to choose color codes for color traits

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10. DISEASE RESISTANCE (Rate from 1(most susceptible) to 9 (most resistant); leave blank if not tested; leave Race or Strain Options blank if polygenic):			
A. Leaf Blights, Wilts, and Local Infection Diseases			
_ Anthracnose Leaf Blight (Colletotrichum graminicola)		_ Anthracnose Leaf Blight	
Common Rust (Puccinia sorghi)		Common Rust	
_ Common Smut (Ustilago maydis)		_ Common Smut	
Eyespot (Kabatiella zeae)		Eyespot	
8 Goss's Wilt (Clavibacter michiganense spp. nebraskensis)		8 Goss's Wilt	
5 Gray Leaf Spot (Cercospora zeae-maydis)		3 Gray Leaf Spot	
_ Helminthosporium Leaf Spot (Bipolaris zeicola)	Race_____	_ Helminthosporium Leaf Spot	Race___
2 Northern Leaf Blight (Exserohilum turcicum)	Race_____	3 Northern Leaf Blight	Race___
Southern Leaf Blight (Bipolaris maydis)	Race_____	Southern Leaf Blight	Race___
Southern Rust (Puccinia Polysora)		Southern Rust	
Stewart's Wilt (Erwinia stewartii)		Stewart's Wilt	
_ Other (Specify)_____		_ Other (Specify)_____	
B. Systemic Diseases			
Corn Lethal Necrosis (MCMV and MDMV)		Corn Lethal Necrosis	
1 Head Smut (Sphacelotheca reiliana)		6 Head Smut	
_ Maize Chlorotic Dwarf Virus (MCDV)		_ Maize Chlorotic Dwarf Virus	
_ Maize Chlorotic Mottle Virus (MCMV)		_ Maize Chlorotic Mottle Virus	
Maize Dwarf Mosaic Virus (MDMV)	Strain_____	Maize Dwarf Mosaic Virus	Strain___
_ Sorghum Downy Mildew of Corn (Peronosclerospora sorghi)		_ Sorghum Downy Mildew of Corn	
_ Other (Specify)_____		_ Other (Specify)_____	
C. Stalk Rots			
Anthracnose Stalk Rot (Colletotrichum graminicola)		Anthracnose Stalk Rot	
_ Diplodia Stalk Rot (Stenocarpella maydis)		_ Diplodia Stalk Rot	
_ Fusarium Stalk Rot (Fusarium moniliforme)		_ Fusarium Stalk Rot	
_ Gibberella Stalk Rot (Gibberella zeae)		_ Gibberella Stalk Rot	
_ Other (Specify)_____		_ Other (Specify)_____	
D. Ear and Kernel Rots			
_ Aspergillus Ear and Kernel Rot (Aspergillus flavus)		_ Aspergillus Ear & Kernel Rot	
5 Diplodia Ear Rot (Stenocarpella maydis)		2 Diplodia Ear Rot	
6 Fusarium Ear and Kernel Rot (Fusarium moniliforme)		6 Fusarium Ear & Kernel Rot	
Gibberella Ear Rot (Gibberella zeae)		Gibberella Ear Rot	
_ Other (Specify)_____		Other (Specify)_____	

Note: Use chart on first page to choose color codes for color traits.

11. INSECT RESISTANCE (Rate from 1(most susceptible) to 9 (most resistant); Leave blank if not tested	St. Dev.	Sample Size		St. Dev.	Sample Size
_ Banks Grass Mite (Oligonychus pratensis)			_ Banks Grass Mite		
Corn Earworm (Helicoverpa zea)			Corn Earworm		
_ Leaf Feeding			_ Leaf Feeding		
Silk Feeding ___._mg larval wt.	____	____	___._	____	____
_ Ear Damage			_ Ear Damage		
_ Corn Leaf Aphid (Rhopalosiphum maidis)			_ Corn Leaf Aphid		
___ Corn Sap Beetle (Carpophilus dimidiatus)			_ Corn Sap Beetle		
European Corn Borer (Ostrinia nubilalis)			European Corn Borer		
1 st Generation (Typically Whorl Leaf Feeding)			1 st Generation		
_ 2 nd Generarion (Typically Leaf Sheath-Collar Feeding)			_ 2 nd Generation		
Stalk Tunneling: ___._cm tunneled/plant	____	____	___._	____	____
Fall Armyworm (Spodoptera frugiperda)			Fall Armyworm		
_ Leaf-Feeding			_ Leaf-Feeding		
Silk-Feeding ___._mg larval wt.	____	____	___._	____	____
_ Maize Weevil (Sitophilus zeamais)			_ Maize Weevil		
_ Northern Rootworm (Diabrotica barberi)			_ Northern Rootworm		
_ Southern Rootworm (Diabrotica undecimpunctata)			_ Southern Rootworm		
Southwestern Corn Borer (Diatraea grandiosella)			Southwestern Corn Borer		
_ Leaf Feeding			_ Leaf Feeding		
Stalk Tunneling: ___._cm tunneled/plant	____	____	___._	____	____
_ Two-spotted Spider Mite (Tetranychus urticae)			_ Two-spotted Spider Mite		
_ Western Rootworm (Diabrotica virgifera virgifera)			_ Western Rootworm		
_ Other (Specify)_____			_ Other (Specify)_____		

12. AGRONOMIC TRAITS:	
4 Stay Green (at 65 days after anthesis) (Rate on scale from 1=worst to 9=excellent)	4 Stay Green
% Dropped Ears (at 65 days after anthesis)	% Dropped ears
_ % Pre-anthesis Brittle Snapping	_ % Pre-anthesis Brittle Snapping
28 % Pre-anthesis Root Lodging	52 % Pre-anthesis Root Lodging
% Post-anthesis Root Lodging (at 65 days after anthesis)	Post-anthesis Root Lodging
6,824.0 Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)	7,584.0 Yield

13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied.)

_ Isozymes _ RFLP's _ RAPD's 1 Other (Specify) SNPs

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COMMENTS (e. g. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit D).

*Sample number reflects the number of plots where the trait(s) was observed and not the number of individual plants scored. Please see 'CLARIFICATION OF DATA IN EXHIBITS B AND C' for details of how plots were set up.

**For these plot-level traits, kernels from approximately 5 representative ears were sampled. 100 unsized kernels were counted and weighed. Up to 500 grams of kernels were sized by a 13/64 inch slot screen.

Insect, disease, brittle snapping, yield and root lodging data are collected mainly from environment where variability for the trait can be obtained within the experiment.

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CLARIFICATION OF DATA IN EXHIBITS B AND C

Please note the data presented in Exhibit B and C, "Objective Description of Variety," are collected primarily at Johnston and/or Dallas Center, Iowa. The data in Table 1 are from two sample t-tests using data collected in Johnston and Dallas Center, IA. These traits in Exhibit B collectively show distinct differences between the two varieties.

For any given year of data collection, our experimental design was set up in a typical complete block design commonly used in agricultural corn research experiments with one replication grown at each location. The experiment procedures generally involve two locations/environments with different planting dates, planted in 17.42 ft. rows with 2 rows for each variety. Approximately 24-30 plants emerged in each of 2 rows for a total of around 48 to 60 plants being evaluated at each location and 96 to 180 plants across locations. For plant level traits, we sampled up to 15 representative plants from the 2 rows of the 2 row plot (group) of plants at each location. For plot level traits we evaluated the 2 row plot (group) and gave a representative score or average on the 48-60 plants in the group within an experiment.

	GROWING DEGREE UNITS (GDUs)		PRECIPITATION (Inches)	
	2008		2008	
Month	Dallas Center	Johnston	Dallas Center	Johnston
May	351	380	3.36	4.54
June	606	641	8.15	13.43
July	716	771	8.26	8.14
August	600	682	1.67	1.24
September	415	469	3.12	5.57
TOTAL	**2688**	**2943**	**24.56**	**32.92**

Growing Degree Units use following formula: GDU = ((T1+T2)/2)-50

Where T1 = minimum temperature for a given day with 50 degrees Fahrenheit as the minimum temperature used and 86 degrees Fahrenheit is the maximum temperature used.

Where T2 = maximum temperature for a given day with 86 degrees Fahrenheit as the maximum temperature used and 50 degrees Fahrenheit is the minimum temperature used.

GDUs are calculated each day and accumulated (summed) over certain number of days.

REPRODUCE LOCALLY. Include form number and edition date on all reproductions. FORM APPROVED - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued *(7 U.S.C. 2421)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Pioneer Hi-Bred International, Inc.		**PHVP4**
4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*	5. TELEPHONE *(Include area code)*	6. FAX *(Include area code)*
7250 NW 62nd Avenue P.O. Box 552 Johnston, IA 50131-0552	**(515) 270-4051**	**(515) 334-4478**
	7. PVPO NUMBER	**#200900390**

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. **If no, please explain.** ☒ **YES** ☐ **NO**

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? **If no, give name of country.** ☒ **YES** ☐ **NO**

10. Is the applicant the original owner? ☒ **YES** ☐ **NO** **If no, please answer one of the following:**

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?
☐ **YES** ☐ **NO** **If no, give name of country**

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?
☒ **YES** ☐ **NO** **If no, give name of country**

11. Additional explanation on ownership *(Trace ownership from original breeder to current owner. Use the reverse for extra space if needed)*:

Pioneer Hi-Bred International, Inc. (PHI), Des Moines, Iowa, and/or its wholly owned subsidiary Pioneer Overseas Corporation (POC), Des Moines, Iowa, is the employer of the plant breeders involved in the selection and development of PHVP4. Pioneer Hi-Bred International and/or Pioneer Overseas Corporation has the sole rights and ownership of PHVP4 pursuant to written contracts that assign all rights in the variety to PHI and/or POC at the time such variety was created. No rights to this variety are retained by any individuals.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT F
DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S)	ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)*	TEMPORARY OR EXPERIMENTAL DESIGNATION
Pioneer Hi-Bred International, Inc.	**7250 NW 62nd Avenue Johnston, IA 50131-0552**	VARIETY NAME **PHVP4**
NAME OF OWNER REPRESENTATIVE (S)	**ADDRESS *(Street and No. or RD No., City, State, and Zip Code and Country)***	**FOR OFFICIAL USE ONLY**
Steven R. Anderson	**7250 NW 62nd Avenue Johnston, IA 50131-0552**	**PVPO NUMBER** **#200900390**

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

Steven R Anderson
Signature

6/29/2009
Date